conducted under the basinwide groundwater RI. Therefore it may not be appropriate to simply update existing plans. However, a final determination as to whether existing plans will be updated for, or new ones specific to the Glendale North OU interim remedial action will need to be created, will be determined by EPA during the remedial design phase.

101. (FS Page 4-4) It is unclear why well rehabilitation is mentioned as a means to prevent contaminated groundwater of the Upper Zone from migrating to the Lower Zone via existing production wells. Well abandonment or reconfiguration should be considered for these wells as discussed in the following section of the report, not just simple rehabilitation. The terminology should be clarified. It should be noted that well reconfiguration does not ensure that the gravel pack also will be fixed. Further, proper abandonment of wells at these depths is often a very difficult process that is not always 100 percent effective.

EPA Response: Well rehabilitation in the context of this FS involves reconfiguration of the well by slip-lining. Other rehabilitation (or reconfiguration) methods may be considered during the detailed design phase of the interim remedy. As described in the FS, well rehabilitation was proposed in order to block off the lower zone sections of production well screens that are screened in both the upper and lower zones thereby eliminating the conduit and preventing cross-contamination between zones. Which wells, if any, should be abandoned or rehabilitated will be determined during the remedial design phase.

102. (FS Page 4-5) Again, using the slip-line casing to prevent cross-contamination does not address the potential hydraulic connection that may occur in the gravel pack of the annulus space.

EPA Response: In general, hydraulic conductivities are higher in the Lower Zone than in the Upper Zone. Assuming remediation in the Upper Zone by groundwater extraction, gradients should be vertically upward. As long as production wells completed in the Lower Zone are pumped at rates that do not reverse the upward gradients, the potential for downward migration should be minimal.

103. (FS Page 4-6) If the potential for degradation of the Lower zone exists, the savings in drilling a more appropriately constructed well is considered a good investment as opposed to future cleanup costs for the Lower Zone.

EPA Response: Drilling new production wells would be costly but may be necessary if abandonment of existing production wells proves to be the only sure means of preventing cross-contamination between zones. This issue will be further evaluated during the remedial design and remedial action phases.

104. (FS Page 4-8) Again, the nitrate concentration should be reduced through blending as opposed to an expensive treatment option, as the nitrates are a remnant of previous land use and probable septic systems in the basin. See Page 3-26 comment.

EPA Response: Again, see EPA Response to ITT Comment 96.

105. (FS Page 4-11) In reference to the proposed Treatment Facility Locations, as mentioned earlier, evaluation of in well treatment systems would minimize the need to have large areas set aside for treatment facilities. In addition, the in well treatment system would be more quiet and less disruptive to residential areas than the pump and treat systems currently proposed.

EPA Response: See EPA Response to ITT Comment 51. Also, the four treatment facility locations presented in the FS are proposed locations. Final determination as to whether or not one of these four proposed locations or another location will be used will be determined during the remedial design phase.

106. (FS Page 4-12) The impact of the treatment plant location could have significant cost impacts on the extraction scenarios and should be evaluated as part of the scenarios. In addition, the feasibility of the site locations should be addressed to determine if in fact the treatment system could be constructed at the proposed locations. As part of the scenarios, the piping corridors should be evaluated to these individual sites and were not in the FS.

EPA Response: The feasibility of the treatment facility locations is discussed in Section 4.0 of the FS. As stated in the FS and EPA's Response to ITT Comment 106 above, the exact location of the treatment facility will be determined during the remedial design phase of the remedial action. Piping corridors were considered during the FS as well. The exact locations of the conveyance system will also be determined during the design phase of the remedy. Also see EPA Responses to ITT Comments 51, 53 and 54.

107. (FS Section 4.2) The groundwater model is used to develop and evaluate extraction scenarios for the Glendale area. The very limited database on which the model is based should not be used to make costly pump and treat decisions. More data are needed before the system is designed and implemented.

EPA Response: EPA disagrees with this comment. The database was and is not limited. The database incorporated all data collected as part of the San Fernando Valley RI as well as other investigations conducted throughout the basin and contained sufficient data to develop the flow model for the Glendale Study Area. The model developed and used based on this database was sufficient and appropriate for making decisions regarding the basic

configuration of the Glendale North OU interim remedy. Also see EPA Responses to ITT Comments 39, 50, 72, 74 and 81.

108. (FS Pages 4-14, 4-15 & 4-17) See discussion of the model, Page 1-18 comment, above.

EPA Response: See Responses to ITT Comments 39, 50, 72, 74, 81, 82, and 107.

109. (FS Page 4-14) The scenarios are based on the model, and the predicting tool is only as good as the data used to develop the model. As discussed in Section 1 comments, this model is based on a limited data set, especially the 2-D solute transport model used to generate the scenarios. Additional points should be incorporated as groundwater monitoring data in the area become available at numerous facility investigations to attempt to fine tune the gross estimates presently being used to decide on extraction scenarios.

EPA Response: Sufficient data was available to propose extraction scenarios for an interim remedy. Again, see Responses to Comments 39, 50, 72, 74, 81, 82, and 107.

110. (FS Page 4-15) Very limited data are used to predict mass volumes in the groundwater and sorbed on to the soil. The estimates do not even consider the potential of separate phase DNAPL and the impact of the presence of DNAPL on the mass calculations. Mass estimates of VOC would be significantly higher and costs correspondingly higher if DNAPL is present (which is highly likely). The model needs to be used as a predictive tool; however, the limitations of the model should be discussed and an estimate of accuracy considered.

EPA Response: The limitations and uncertainties associated with the modeling effort are discussed in detail on Pages 4-12 through 4-14 of the FS. Again, see EPA Responses to ITT Comments 39, 50, 70, 72, 74, 81, 82, and 107.

111. (FS Page 4-16) The TCE and PCE concentrations used in the model were an average of concentrations detected with depth in the aquifer in October 1990. No indication has been observed regarding the variability over time of the concentration in the wells and if any temporal trends have been observed in the sampling. Generally, several calendar quarters of data are often evaluated to establish trends and identify potential anomalies in the data which may need to be addressed and be accounted for in the modeling effort.

EPA Response: EPA disagrees with this comment. Sufficient information was available to make decisions regarding the Glendale North OU interim remedy. EPA has been monitoring the groundwater quality on a quarterly basis since 1991 and will continue to do so. Quarterly variations in contaminant concentrations have been small.

EPA also had the benefit of reviewing and using sampling data obtained between 1979-present from water supply wells located throughout the San Fernando Valley See EPA Responses to ITT Comments 8, 11, 13, 50, 73, 81 and 82.

112. (FS Page 4-17) The modeling effort for the GSA takes into account the extraction activities proposed in the North Hollywood unit. However, no consideration is made for delays, shut downs, potentially variable pumping, and other potential problems and their impact to the GSA model and the corresponding effects over time. The limitation should be discussed as impacted by the upgradient extraction. In addition, the potential of additional extraction wells upgradient should have been considered in the future.

EPA Response: The effects of pumping in the Burbank Operable Unit were considered as well (FS Page 4-17). Delays, shut downs, and variable pumping would impact the system on the short-term and should not influence remediation over the long-term as long as the system is properly designed. Again, see EPA Responses to ITT Comments 8, 11, 13, 50, 73, 74, 81 and 82.

113. (FS Page 4-17) A limited discussion is provided on the Burbank OU; however, its mass contribution and associated impact on the Glendale Study Area is not included and therefore it is not possible to determine whether information on the Burbank OU might be relevant in evaluating this OU.

EPA Response: See EPA Response to ITT Comment 112.

114. (FS Page 4-17) A design and operation time of 15 years is specified. Given what is known today regarding pump and treat systems, DNAPL compounds, and extended cleanup times, this period may be sufficient to reach the point of diminishing return but not cleanup. A comprehensive groundwater management strategy should have been discussed which combines source removal treatment of the point of use and possible control using the basin configuration with a comparison of this relative to long term costs of all the operable unit remedies.

EPA Response: Again, the Glendale North OU remedy is an interim remedy and not a final remedy. See EPA Responses to ITT Comments 6, 9, 30, 85 and to other ITT comments above.

115. (FS Page 4-18) The extraction well sites appear to be chosen primarily by the location of chemical "highs" which are biased by well locations within the GSA, with little consideration of the hydraulic properties that need to be considered to optimize the locations. Additionally, significant hydraulic data needs to be collected to site the extraction wells.

EPA Response: EPA disagrees with this comment. The exact locations of the extraction wells will be determined during the design phase of the remedy. The extraction well locations and pumping rates presented in the FS report were proposals. During RD, one of these proposals or a new one may be selected based on new data not available at the time of the FS. Also see EPA Responses to ITT comments 50, 74, 81, 107 and other ITT comments above.

116. (FS 4-19) The figure for groundwater modeling needs to be labeled with the Raymond Hills Fault and the Verdugo drainage.

EPA Response: The Verdugo Fault and the Raymond Fault are shown on Figure 1.2-7 of the FS.

117. (FS Page 4-19) If DNAPL is present in a separate phase then extended cleanup times can be expected because twelve years of O&M are unrealistic, and this issue must be addressed in the text.

EPA Response: See EPA Response to ITT Comment 70 and to other ITT comments above.

118. (FS Page 4-19) It should be explained why the O&M costs are presented as being estimated over a 12-year operation period, or 15 years from October 1990. Again, this O&M period is misleadingly short based on experience at the sites and the potential for DNAPL.

EPA Response: Again, the Glendale North OU is an interim remedy with limited objectives and not a final remedy. The 12-year period represents the point of diminishing return for the interim remedy as determined by modeling during the FS. As stated on Page 5-2 of the FS, "Each alternative assumes that the start up of the remediation system will be delayed at least three years and have an operating life of 12 years. The 12-year operating life of the system was based on the results of the solute transport modeling which considered a 15-year period with an initial 3-year period of no groundwater extraction. The potential remedial alternatives analyzed in this FS are 12 years in duration. At the end of the interim period, further action may be required and will be evaluated at that time." The 12-year period was also discussed in Administrative Record document number 255. Also see EPA Response to ITT Comment 70 and other ITT Comments above.

119. (FS Page 4-22 to 4-37) The various extraction scenarios are discussed and the estimates of the mass of VOC removal over time are predicted using the model along with the decrease in concentration at the extraction well. It would be more prudent to evaluate the efficiency of the mass removal over time and compare the relative mass removal period clean up program. Cost efficiency may be recognized with other standard technologies to provide greater initial mass removal and then reevaluate the system and make further assessment as to the need for further remedial

activity. The majority of the source removal occurs in the initial years at which point the system should be reevaluated and assessed as to whether continued operation is cost-effective as to going to controls at the point of use only.

As the model is the basis for the majority of the extraction scenarios and later evaluation, it will need to be updated and refined if an extraction scenario is chosen. No discussion is included that the extraction remedy will need to be evaluated over time to measure the efficiency of the system during operation. As this model is based on limited data, data acquired as extraction systems are placed on line will provide much needed hydraulic data. Future data acquired through extraction wells and additional well data from sources throughout the basin will need to be used to refine the model.

Evaluation of VOC concentration data from the system in the initial states will potentially indicate if separate phase DNAPL is present in the aquifer. Since this was [not] considered in the objectives of the FS, it would need to be reevaluated.

EPA Response: See EPA Responses to ITT Comments 70, 72, 81, 82, 107 and other ITT Comments above.

120. (FS Page 5-2) The costing for the alternatives assumes the plan will be implemented within three years. The timing seems optimistic considering the limited data on which the alternatives are based. A contingency or an escalation factor for delays based on the inflation rate of the 1990 dollar should have been added.

EPA Response: See Appendices C and D for a description of how the present worth factor was calculated. It will be apparent that a contingency or escalation factor was considered for the projected 3-year delay. Also see EPA Response to Comments 51, 53, 54, 74, and other ITT Comments above.

121. (FS Page 5-2) Section 5-2 discussed the screening of the alternatives. The evaluation of the alternative is based on the model which, in turn is based on limited data and is of questionable accuracy. The model will need to be updated and should be refined with additional data to make more informed decisions on the alternative when more data are made available. However, the model still should be considered a planning tool. See [earlier] comments [on] Section[s] 1 and 4, above.

EPA Response: Again, see EPA Responses to ITT Comments 70, 72, 81, 82, 107 and other ITT Comments above.

122. (FS Page 5-3) Exact locations for extraction, injection and monitoring wells and the treatment facility are not determined and approximate locations were used for screening. The purpose of the FS is to provide accurate comparisons based on similar evaluation

criteria. The location could have substantial cost impact depending on a number of factors, including piping distances, and right of way.

EPA Response: See EPA Responses to ITT Comments 53 and 54 regarding the accuracy of the cost estimation provided in the FS. The exact locations of the extraction, injection, monitoring wells, and the treatment facility should be determined during the design phase of the remedy.

123. (FS Page 5-9) Numerous options depend on the acceptance of the treated water by the City of Glendale, as described for the example in Section 5.2.2.2. Should the City reject the treated water, the costs for alternative water disposal options could potentially be significantly increased, which should trigger consideration of alternative technologies with appropriate public review prior to proceeding.

EPA Response: A variety of other disposal options, including reinjection, recharge and discharge to the Los Angeles River, were considered in the development and detailed analysis of remedial alternatives. Also note that EPA's preferred alternative (Alternative 2 and Alternative 7) includes reinjection (Alternative 7) as a contingency should the municipality chose not to accept all or part of the treated water. Therefore, no further public review would be necessary in the event that the City does not accept delivery of the treated water. Finally, please review Section 11 of the ROD for the contingencies that will be implemented in the event that the City does not accept all or a portion of the treated water.

124. (FS Page 5-21) As the FS addresses an interim remedy and no ARARs are established for the aquifer, the potential of a variance should be considered to allow for the recharge of groundwater with levels of low VOC concentrations which are below the concentration in the water into which it is recharged. This scenario would be considered for the cost savings which then could be used for a point-of-use treatment system as part of a basin-wide management approach. There is no discussion of whether the Headworks Spreading Ground could accept the volume of treated groundwater, and there is no discussion of the impact that periods of extended rainfall would have on the ability to discharge treated groundwater to the Spreading Grounds.

EPA Response: The capacity of the Headworks Spreading Grounds is discussed in Appendix A of the FS. As the aquifer is a potable supply aquifer, the VOC levels in the treated water would need to meet MCLs for reinjection or recharge as discussed in the Section 10 (ARARs) of the ROD. Also see EPA Responses to ITT Comments 31 and 86.

125. (FS Page 6-6) Certain alternatives do not have exact locations for wells or treatment facilities. The FS states that "flexibility to chose the exact locations and to adjust on the specific design criteria during the remedial design phase, when further information is available, is necessary to maximize the efficiency, reliability, and cost-effectiveness of the remedial action." It is not clear what and when additional data will be available, how it will be used to complete and improve the evaluation and why these data should not be incorporated in this FS before this FS is relied upon for decision-making. The public must then be allowed a more reasonable period to comment on that document, with the additional data provided to better substantiate the proposed alternatives than is presently provided.

EPA Response: Proposed locations for wells and treatment facilities are presented in the FS and were available for review and public comment during the sixty day public comment period. No further public comment will occur. Final locations will be determined during remedial design. Also, see EPA Response to ITT Comment 122.

126. (FS Page 6-38) Nitrates and TDS should not be considered for treatment as these materials are present throughout the basin and are not source-specific.

EPA Response: Treatment for nitrate may be required to meet discharge requirements for use as potable supply, discharge to the Los Angeles River, reinjection, or recharge at the Headworks Spreading Grounds. Please see Section 10 of the ROD for EPA's final ARARs determinations for the Glendale North OU.

<u>The following comments were made by ITT regarding Section 7 of the Remedial Investigation Report for the Glendale Study Area</u>

127. (RI Page 7-8) The RME is identified as the upper 95 percent confidence limit of the arithmetic mean of the ground water quality data. We disagree as this does not account for uncertainty in the frequency or duration of exposure, toxicity estimates, intake estimates or the multiple routes of exposure which are summed to estimate total exposure. Instead, a Monte-Carlo type assessment should have been performed as per the new EPA guidelines referenced in the general comments.

EPA's Response: EPA disagrees with this comment. The risk assessment for the Glendale North OU was conducted in accordance with relevant EPA guidance including: <u>Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA</u> (USEPA, 1988), <u>Risk Assessment Guidance for Superfund, Vol. I Health Evaluation Manual (Part A)</u> and <u>Vol. 2 Ecological Assessment</u> (USEPA, 1989), <u>The Exposure Factors Handbook</u> (USEPA 1989), and <u>Risk Assessment Guidance for Superfund Human Health Risk Assessment</u> (USEPA, 1989). Since the risk assessment was conducted properly